INDEX TO VOLUME 14

A

Page

Absorbancy of chromic acid solutions, RP797 693
Adsorption from soap solutions, RP801 765
Acid, effect on leather, RP802 771
Acoustics of buildings, RP800 749
Adiabatic storage of cements, RP799 723
Adsorption of HCl by collagen, RP765 217
Aging, effect on hosiery performance, RP753 1
Aging of rubber, RP795 667
Aircraft fabric, fire-resistant, RP788 575
Aircraft fabrics, RP758 67
Aircraft propeller vibrations, RP764 189
Air, refractive index of, RP776 393
Air storage of cement concretes, RP799 723
Aldonates of lead and calcium, optical rotations and other properties of, RP770 305
Alloys, gold-cobalt, electrical properties, RP789 589
Alumel-chromel thermocouples, RP767 239
Aluminum soap, effect on hosiery, RP753 1
American National screw threads, tests on bolts with, RP763 139
Amino nitrogen contents of wool and collagen, RP787 563
Antimony, thermal expansion and density, RP784 523
Antioxidants, effect in rubber, RP795 667
Approximation of roots of equations, RP790 595
Architectural acoustics, RP800 749
Arc spectrum of iron, RP755 33
Arginine, determination of, in proteins, RP787 563
Argon, infrared spectrum of, RP781 487
Atmospheric exposure of nonferrous screen wire cloth, RP803 775
Augers, dies, and spacers for clay-products extrusion machine, RP798 711

B

Ballif, Paul S., Mack J. West, Walter Ramberg and, A method for determining stresses in a nonrotating propeller blade vibrating with a natural frequency, RP764 189
Barium xylonate, preparation of, RP773 359
Batteries, storage reactions in, RP778 449
Beek, John, Jr., Combining weight of collagen, RP765 217
—— *Charles L. Critchfield and,* A method for finding the roots of the equation $f(x)=0$ where f is analytic, RP790 595
—— *Charles L. Critchfield, Everett L. Wallace and,* Effect of sulphuric acid on chrome-tanned leather, RP802 771
Bekkedahl, Norman, Archibald T. McPherson and, Heats of reaction of the system: rubber-sulphur, RP791 601
Bicking, George W., Martin J. O'Leary, Merle B. Shaw and, A study of the relation of some properties of cotton rags to the strength and stability of experimental papers made from them, RP794 649
Boiling point apparatus, RP796 685
Bolts, properties of, RP763 139
Bowker, Roy C., Everett L. Wallace, and Joseph R. Kanagy, Influence of magnesium sulphate on the deterioration of vegetable-tanned leather by sulphuric acid, RP761 121

C

Calcium aldonates, optical rotations of, RP770 305
Calcium chloride, effect on concretes and cements, RP782 499
Calcium xylonate, preparation of, RP773 359
Calorimeter for determining heats of reaction of the system: rubber-sulphur, RP791 601
Carbon, adsorption of soap by, RP801 765
Cathetometer, precision, RP774 363
Cement, heat measurements of, RP782 499
Cement, particle size of, RP777 419
Cements, high-early-strength, RP799 723
Cement-water ratio of cement mortars and concretes, RP799 723
Chemical reactions in storage batteries, RP778 449
Chrisler, Vivian L., and Wilbert F. Snyder, Recent sound-transmission measurements at the National Bureau of Standards, RP800 749
Chromaticity scales from Maxwell triangle, RP756 41
Chromel-alumel thermocouples, RP767 239
Chrome-tanned leather, effect of acid on, RP802 771
Chromium deposition, theory of, RP797 693
Clay minerals, thermal behavior and dehydration of, RP792 615
Clay-products, extrusion machine, performance of, RP798 711
Cleveland, Richard S., Herbert F. Schiefer and, Factors affecting the performance of hosiery on the hosiery testing machine, RP753 1
Cloth, insect screen wire, tests on, RP803 775
Cobalt-gold alloys, resistance and thermoelectric properties, RP789 589
Cold-junction corrections for thermocouples, RP768 247
Cold light, filter for obtaining, RP785 545
Collagen, amino nitrogen and arginine contents of, RP787 563
Collagen, combining weight of, RP765 217
Colorimetry, filter for obtaining light at 560 mμ, RP785 545
Color triangle, uniform-chromaticity scale, RP756 41
Columbium, spectra of, RP793 629
Compounds, high molecular weight, boiling points of, RP796 685
Compressibility of rubber-sulphur compounds, RP760 99
Concrete, effect of calcium chloride on, RP782 499
Concrete, effect of cement grain size on properties of, RP777 419
Concretes, high-early-strength, RP799 723
Copper, nondeposition in chromic acid bath, RP797 693
Copper, wave lengths, RP783 519
Corrosion of screen wire cloth, RP803 775
Craig, D. Norman, George W. Vinal and, Chemical reactions in the lead storage battery, RP778 449
Critchfield, Charles L., John Beek, Jr., Everett L. Wallace and, Effect of sulphuric acid on chrome-tanned leather, RP802 771
—— *and John Beek, Jr.,* A method for finding the roots of the equation $f(x)=0$ where f is analytic, RP790 595
Critical frequency recording, RP769 283
Crystals of antimony, thermal expansion of, RP784 523
Cummings, Arthur D., Archibald T. McPherson and, Refractive index of rubber, RP786 553
Current transformers, accuracy of, RP775 367

D

Page

Dahl, A. I., G. J. Gowens, Wm. F. Roeser and, Standard tables for chromel-alumel thermocouples, RP767 ... 239
Dardelet screw threads, tests on bolts with, RP763 ... 139
Density of antimony, RP784 ... 523
Density of rubber-sulphur compounds, RP760 ... 99
Density of soda-alumina-silica glasses, RP762 ... 133
Dickite, thermal behavior of, RP792 ... 615
Dies for clay-products extrusion machine, RP798 ... 711
Dope for aircraft fabric {RP758 ... 67; RP788 ... 575}
Drying and soaking, effect on strength of cement mortars and concretes, RP799 ... 723
Dyeing, effect on hosiery performance, RP753 ... 1
Dynamic strains in aircraft propellers, RP764 ... 189

E

Ebullioscope for measuring boiling points of compounds of high molecular weight, RP796 ... 685
Ebullioscopic method of determination of molecular weights of petroleum fractions, RP772 ... 345
Electrical resistance of gold-cobalt alloys, RP789 ... 589
Electrolytic oxidation of xylose, RP773 ... 359
Elutriation of cement, RP777 ... 419
Emf-temperature relation of chromel-alumel thermocouples, RP767 ... 239
Equations, finding roots of, RP790 ... 595
Ewell, Raymond H., Herbert Insley and, Thermal behavior of the kaolin minerals, RP792 ... 615
Expansion of cement mortars and concretes, RP799 ... 723
Expansion, thermal, of glass, RP762 ... 133
Expansion, thermal, of mono- and polycrystalline antimony, RP784 ... 523
Expansivity, thermal, of rubber-sulphur compounds, RP760 ... 99
Exposure tests of cements, RP799 ... 723
Exposure tests on colorless waterproofings, RP771 ... 317
Extrusion machine for clay products, RP798 ... 711

F

Fabric, fire-resistant airplane, RP788 ... 575
Fabrics, aircraft, RP758 ... 67
Faick, Conrad A., John C. Young, Donald Hubbard, and Alfred N. Finn, Index of refraction, density, and thermal expansion of some soda-alumina-silica glasses as functions of the composition, RP762 ... 133
Fatigue of aircraft propellers, RP764 ... 189
Fatigue properties of wire, RP754 ... 17
Fiber composition, effect on hosiery, RP753 ... 1
Fibers, rag, stability of papers made from, RP794 ... 649
Filter for obtaining light at wave length mμ, RP785 ... 545
Fineness of cement {RP777 ... 419; RP799 ... 723}
Fineness test of molding sand, RP757 ... 59
Finn, Alfred N., John C. Young, Donald Hubbard, Conrad A. Faick and, Index of refraction, density, and thermal expansion of some soda-alumina-silica glasses as functions of the composition, RP762 ... 133
Fireproofing of aircraft fabric, RP788 ... 575
Fixed points for thermocouple calibrations, RP768 ... 247
Flow of cement mortars and concretes, RP799 ... 723
Foam, adsorption of soap in, RP801 ... 765
Foundry molding sands, RP757 ... 59
Freezing and thawing of cement mortars and concretes, RP799 ... 723
Frequency monitor, radio, RP766 ... 227
Frequency, radio, measurements of, RP759 ... 85
Frush, Harriet L., Horace S. Isbell and, Electrolytic oxidation of xylose in the presence of alkaline earth bromides and carbonates, RP773 ... 359
Fuller's earth, adsorption of soap by, RP801 ... 765

G

Page

Galvanized steel wire fatigue properties, RP754 ... 17
Gas-cell fabrics, RP758 ... 67
Gases, noble, infrared spectrum of, RP781 ... 487
Gibson, Kasson S., A filter for obtaining light at wave length 560 mμ, RP785 ... 545
Gilliland, Theodore R., Multifrequency ionosphere recording and its significance, RP769 ... 283
Glass, optical, refractive-index of, RP776 ... 393
Glass, refractivity, density, thermal expansion, and composition of, RP762 ... 133
Gold-cobalt alloys, resistance and thermoelectric properties, RP789 ... 589
Gowens, G. J., A. I. Dahl, Wm. F. Roeser and, Standard tables for chromel-alumel thermocouples, RP767 ... 239
Granulometric composition of cement, RP777 ... 419

H

Hall, Elmer L., Vincent E. Heaton, and Evan G. Lapham, The national primary standard of radio frequency, RP759 ... 85
Harris, Milton, Joseph R. Kanagy and, Amino-nitrogen contents of wool and collagen, RP787 ... 563
—— *Harvey A. Neville and,* Selective adsorption from soap solutions, RP801 ... 765
Heat evolution during hardening of cements, RP799 ... 723
Heat measurements on cement, RP782 ... 499
Heaton, Vincent E., Evan G. Lapham, Elmer L. Hall and, The national primary standard of radio frequency, RP759 ... 85
Heats of reaction of the system: rubber-sulphur, RP791 ... 601
Helium, infrared spectrum of, RP781 ... 487
Hidnert, Peter, Thermal expansion of monocrystalline and polycrystalline antimony, RP784 ... 523
Hollow clay ware extrusion machine, performance of, RP798 ... 711
Holt, William L., Rees F. Tener and, Effect of antioxidants on the natural and the accelerated aging of rubber, RP795 ... 667
Hosiery performance factors, RP753 ... 1
Hubbard, Donald, Alfred N. Finn, John C. Young, Conrad A. Faick and, Index of refraction, density, and thermal expansion of some soda-alumina-silica glasses as functions of the composition, RP762 ... 133
Humidity, effect on strength of cement concretes, RP799 ... 723
Hydrocarbons, nonvolatile, molecular weights of, RP772 ... 345
Hydrolysis of lead aldonates, RP770 ... 305

I

Impact tests on bolts, RP763 ... 139
Index of refraction of optical glass, measurement of, RP776 ... 393
Index of refraction of soda-alumina-silica glasses, RP762 ... 133
Infrared arc spectrum of Cu, RP783 ... 519
Infrared arc spectrum of Fe, RP755 ... 33
Infrared spectra of noble gases, RP781 ... 487
Inks, relation to preservation of records, RP779 ... 463
Insect screen wire cloth, nonferrous, tests on, RP803 ... 775
Insley, Herbert, and Raymond H. Ewell, Thermal behavior of the kaolin minerals, RP792 ... 615
Interference measurements in arc spectrum of iron, RP755 ... 33
Ionization of the atmosphere, RP769 ... 283
Ionosphere layers, critical frequencies of, RP769 ... 283
Ionosphere, recent studies, RP780 ... 469
Iron arc spectrum, RP755 ... 33
Isbell, Horace S., Optical rotations and other properties of the lead and calcium aldonates, RP770 ... 305
—— *and Harriet L. Frush,* Electrolytic oxidation of xylose in the presence of alkaline earth bromides and carbonates, RP773 ... 359

J

Jackson, Clarence E., and C. M. Saeger, Jr., Use of the pipette method in the fineness test of molding sand, RP757 — 59
Johnson, Paul V., and Ray T. Stull, Performance of a hollow-ware extrusion machine with different combinations of augers, spacers, and dies, RP798 — 711
Judd, Deane B., A Maxwell triangle yielding uniform chromaticity scales, RP756 — 41
Judson, Elbert B., Samuel S. Kirby and, Recent studies of the ionosphere, RP780 — 469

K

Kanagy, Joseph R., and Milton Harris, Amino-nitrogen contents of wool and collagen, RP787 — 563
— *Everett L. Wallace, Roy C. Bowker and*, Influence of magnesium sulphate on the deterioration of vegetable-tanned leather by sulphuric acid, RP761 — 121
Kaolin minerals, thermal behavior of, RP792 — 615
Kaolinite, thermal behavior of, RP792 — 615
Kasper, Charles, Mechanism of chromium deposition from the chromic acid bath, RP797 — 693
Kennelly-Heaviside layers (see ionosphere) — RP769 283, RP780 469
Kessler, Daniel W., Experiments on exterior waterproofing materials for masonry, RP771 — 317
Kiess, C. C., Arc spectrum of copper in the infrared, RP783 — 519
Kimberly, Arthur E., Charles G. Weber, Elmer W. Zimmerman and, Relation of ink to the preservation of written records, RP779 — 463
Kirby, Samuel S., and Elbert B. Judson, Recent studies of the ionosphere, RP780 — 469
Kline, Gordon M., Fire-resistant doped fabric for aircraft, RP788 — 575
— Moisture relations of aircraft fabrics, RP758 — 67
Krypton, infrared spectrum, RP781 — 487

L

Lapham, Evan G., Monitoring the standard radio-frequency emissions, RP766 — 227
— *Vincent E. Heaton, Elmer L. Hall* and, The national primary standard of radio frequency, RP759 — 85
Laundering as affecting hosiery, RP753 — 1
Lead aldonates, optical rotations of, RP770 — 305
Leads, effect of arrangement on accuracy of current transformers, RP775 — 367
Leather, deterioration by sulphuric acid, RP761 — 121
Leather, effect of acid on, RP802 — 771
Length measurement, precision cathetometer, RP774 — 363
Light filter for obtaining wave length 560 mμ, RP785 — 545

M

McPherson, Archibald T., and Arthur D. Cummings, Refractive index of rubber, RP786 — 553
— and *Norman Bekkedahl*, Heats of reaction of the system: rubber-sulphur, RP791 — 601
Magnesium sulphate, influence on deterioration of leather by sulphuric acid, RP761 — 121
Magnesium xylonate, preparation of, RP773 — 359
Mair, Beveridge J., An accurate ebullioscopic method for determining the molecular weights of nonvolatile petroleum fractions, RP772 — 345
Masonry waterproofings, RP771 — 317
Maxwell triangle, uniform-chromaticity scale, RP756 — 41
Meggers, William F., Infrared spectra of noble gases (10500 to 13000 A), RP781 — 487
— Interference measurements in the infrared arc spectrum of iron, RP755 — 33
— and *Bourdon F. Scribner*, Multiplets and terms in the first two spectra of columbium, RP793 — 629
Minerals, kaolin, thermal behavior, RP792 — 615
Moisture absorption by aircraft fabrics, RP758 — 67
Molding sand, fineness test, RP757 — 59
Molecular weights of nonvolatile petroleum fractions, determination of, RP772 — 345
Monitor, radio-frequency, RP766 — 227
Moon, Charles, A precision cathetometer, RP774 — 363
Mortars, cement, RP799 — 723
Mortars, effect of cement size on properties of, RP777 — 419
Multifrequency ionosphere recording, RP769 — 283
Multiplets in columbium spectra, RP793 — 629
Mutarotation of lead aldonates, RP770 — 305

N

Neon, infrared spectrum, RP781 — 487
Neville, Harvey A., and Milton Harris, Selective adsorption from soap solutions, RP801 — 765
Noble gases, infrared spectra of, RP781 — 487
Nonferrous screen wire cloth, RP803 — 775
Nusbaum, George W., Edgar O. Seaquist, Herbert L. Whittemore and, Impact and static tensile properties of bolts, RP763 — 139
Nuts and bolts, properties of, RP763 — 139

O

Oil, adsorption of soap by, RP801 — 765
Oils, lubricating, measurement of boiling points, RP796 — 685
O'Leary, Martin J., George W. Bicking, Merle B. Shaw and, A study of the relation of some properties of cotton rags to the strength and stability of experimental papers made from them, RP794 — 649
Optical glass, refractive-index measurements of, RP776 — 393
Optical rotations and other properties of lead and calcium aldonates, RP770 — 305
Oscillators, piezo, use of, in radio-frequency measurements, RP759 — 85
Oxidation of xylose, RP773 — 359

P

Paper, effect of inks on aging of, RP779 — 463
Papers, stability of rag-fiber, RP794 — 649
Park, John H., Accuracy of high-range current transformers, RP775 — 367
Particle size of cements, RP799 — 723
Pastes, effect of cement grain size on properties of, RP777 — 419
Performance of rag-fiber papers, RP794 — 649
Petroleum fractions, nonvolatile, molecular weights of, RP772 — 345
pH, criterion of leather deterioration, RP761 — 121
Piezo oscillator for radio-frequency monitor, RP766 — 227
Piezo oscillators, use of, in primary standard of radio frequency, RP759 — 85
Pigman, George L., Lacey A. Wagner, J. Arthur Swenson and, Effect of the granulometric composition of cement on the properties of pastes, mortars, and concretes, RP777 — 419
Pipette method fineness test of molding sand, RP757 — 59
Pisapia, Edward A., Louis Shuman and, Behavior of high-early-strength concretes and mortars under various temperature and humidity conditions, RP799 — 723
Plasticity of cement, RP777 — 419
Polarization in the chromic acid bath, RP797 — 693
Primary standard of radio frequency, RP759 — 85
Prism refractometry, RP776 — 393
Propeller, aircraft, vibration of, RP764 — 189
Pyrometric filter for obtaining light at wave length 560 mμ, RP785 — 545

Q

Quick, G. Willard, Atmospheric-exposure tests on screen wire cloth, RP803 — 775

R

Radio frequencies, critical, for ionosphere layers, RP780 — 469
Radio-frequency measurements, RP766 — 227
Radio-frequency standard, RP759 — 85
Radio-wave phenomena — RP769 283, RP780 469

Page

Rags, stability of papers made from, RP794 649
Ramberg, Walter, Paul S. Ballif, and Mack J. West, A method for determining stresses in a nonrotating propeller blade vibrating with a natural frequency, RP764 189
Rapp, Paul, Effect of calcium chloride on portland cements and concretes, RP782 499
Rare-metal thermocouples, annealing of, RP768 247
Reaction rate, influence on polarization, RP797 693
Records, preservation of, RP779 463
Refractive index measurements of air, RP776 393
Refractive index of rubber, RP786 553
Refractivity of soda-alumina-silica glasses, RP762 133
Refractometry, minimum-deviation prism, RP776 393
Resistance standards, wire, RP789 589
Resistivity, electrical, of gold-cobalt alloys, RP789 589
Resonant vibrations in propellers, RP764 189
Roeser, Wm. F., and H. T. Wensel, Methods of testing thermocouples and thermocouple materials, RP768 247
—— *A. I. Dahl, and G. J. Gowens*, Standard tables for chromel-alumel thermocouples, RP767 239
Roots of equations, method of finding, RP790 595
Rubber, effect of antioxidants in, RP795 667
Rubber, heats of reaction with sulphur, RP791 601
Rubber-sulphur compounds, refractive index of, RP786 553
Rubber-sulphur compounds, specific volume, compressibility and volume thermal expansivity of, RP760 99

S

Saeger, C. M., Jr., Clarence E. Jackson and, Use of the pipette method in the fineness test of molding sand, RP757 59
Sand, molding, fineness test, RP757 59
Schicktanz, Sylvester T., An apparatus for measuring the boiling points of lubricating oils and other compounds of high molecular weight at reduced pressures, RP796 685
Schiefer, Herbert F., and Richard S. Cleveland, Factors affecting the performance of hosiery on the hosiery testing machine, RP753 1
Schuman, Louis, and Edward A. Pisapia, Behavior of high-early-strength concretes and mortars under various temperature and humidity conditions, RP799 723
Scott, Arnold H., Specific volume, compressibility, and volume thermal expansivity of rubber-sulphur compounds, RP760 99
Screen wire cloth tests, RP803 775
Screw threads, tests of bolts with different, RP763 139
Scribner, Bourdon F., William F. Meggers and, Multiplets and terms in the first two spectra of columbium, RP793 629
Seaquist, Edgar O., George W. Nusbaum, Herbert L. Whittemore and, Impact and static tensile properties of bolts, RP763 139
Sensibility to dominant wave length and purity change, RP756 41
Setting time of cements, RP799 723
Shaw, Merle B., George W. Bicking, and Martin J. O'Leary, A study of the relation of some properties of cotton rags to the strength and stability of experimental papers made from them, RP794 649
Shelton, Stephen M., and William H. Swanger, Fatigue properties of steel wire, RP754 17
Size of cement particles, RP799 723
Snyder, Wilbert F., and Vivian L. Chrisler, Recent sound-transmission measurements at the National Bureau of Standards, RP800 749
Soap solutions, adsorption from, RP801 765
Sound transmission, RP800 749
Spacers for clay-products extrusion machine, RP798 711
Spectra of columbium, RP793 629
Spectra of noble gases, RP781 487
Spectrophotometric measurements on copper, RP783 519
Spectrophotometry, filter for abridged method at wave length 560 mμ, RP785 545
Spectroscopic measurement of columbium, RP793 629
Spectrum, chromaticity, sensibility to wave-length change in, RP756 41
Spectrum of Cu, RP783 519
Spectrum of iron, RP755 33
Standard of radio frequency, RP759 85
Standard, radio-frequency emissions, RP766 227
Steel wire fatigue properties, RP754 17
Stockings, testing of, RP753 1
Stone preservatives, RP771 317
Storage batteries, reactions in, RP778 449
Storage of cement concretes, RP799 723
Strains, dynamic, in aircraft propellers, RP764 189
Strength of cement concretes, RP799 723
Strength of screw threads, RP763 139
Stress distribution in aircraft propellers, RP764 189
Strontium xylonate, preparation of, RP773 359
Stull, Ray T., Paul V. Johnson and, Performance of a hollow ware extrusion machine with different combinations of augers, spacers, and dies, RP798 711
Sulphur, heats of reaction with rubber, RP791 601
Sulphuric acid, consumption of, in storage batteries, RP778 449
Sulphuric acid, deterioration of leather by, RP761 121
Swanger, William H., Stephen M. Shelton and, Fatigue properties of steel wire, RP754 17
Swenson, J. Arthur, Lacey A. Wagner, and George L. Pigman, Effect of the granulometric composition of cement on the properties of pastes, mortars, and concretes, RP777 419

T

Tables for chromel-alumel thermocouples, RP767 239
Tanned leather, deterioration by sulphuric acid, RP761 121
Temperature, color, sensibility to change in, RP756 41
Temperature, effect on strength of cement concretes, RP799 723
Temperature-emf relation of chromel-alumel thermocouples, RP767 239
Temperature measurement and control, RP768 247
Tener, Rees F., and William L. Holt, Effect of antioxidants on the natural and the accelerated aging of rubber, RP795 667
Tensile strength of bolts, RP763 139
Terms in columbium spectra, RP793 629
Textile fiber composition, effect on hosiery performance, RP753 1
Textiles, adsorption of soap by, RP801 765
Thermal behavior of kaolin minerals, RP792 615
Thermal expansion of antimony, RP784 523
Thermal expansion of soda-alumina-silica glasses, RP762 133
Thermal expansivity of rubber-sulphur compounds, RP760 99
Thermocouple materials, testing of, RP768 247
Thermocouples, chromel-alumel, RP767 239
Thermocouples, testing of, RP768 247
Thermoelectric power of gold-cobalt alloys, RP789 589
Thomas, James L., Gold-cobalt resistance alloys, RP789 589
Thunderstorms, effect on ionization of ionosphere, RP780 469
Tilton, Leroy W., Standard conditions for precise prism refractometry, RP776 393
Transformers, accuracy of current, RP775 367
Transmission of sound, RP800 749
Turbidimeter measurements of cement, RP777 419

V

Page

Valve spring wire fatigue properties, RP754... 17
Vibration of aircraft propellers, RP764... 189
Vinal, George W., and D. Norman Craig, Chemical reactions in the lead storage battery, RP778... 449
Vision, uniform-chromaticity scale triangle, RP756... 41
Volume thermal expansivity of rubber-sulphur compounds, RP760... 99

W

Wagner, Lacey A., George L. Pigman, J. Arthur Swenson and, Effect of granulometric composition of cement on the properties of pastes, mortars, and concretes, RP777... 419
Wallace, Everett L., John Beek, Jr., and Charles L. Critchfield, Effect of sulphuric acid on chrome-tanned leather, RP802... 771
— *Joseph R. Kanagy, Roy C. Bowker* and, Influence of magnesium sulphate on the deterioration of vegetable-tanned leather by sulphuric acid, RP761... 121
Water-cement ratio of high-early-strength cement mortars and concretes, RP799... 723
Water loss from cement concretes, RP799... 723
Waterproofing materials for masonry, RP771... 317
Wave lengths of Cu, RP783... 519
Wave length 560 mμ, filter for obtaining light at, RP785... 545
Wave-length measurements of columbium, RP793... 629
Wave-length measurements in arc spectrum of iron, RP755... 33
Wave lengths of noble gases, RP781... 487
Weber, Charles G., Arthur E. Kimberly, Elmer W. Zimmerman and, Relation of ink to the preservation of written records, RP779... 463
Weight, combining, of collagen, RP765... 217
Wensel, H. T., Wm. F. Roeser and, Methods of testing thermocouples and thermocouple materials, RP768... 247
West, Mack J., Paul S. Ballif, Walter Ramberg and, A method for determining stresses in a nonrotating propeller blade vibrating with a natural frequency, RP764... 189
Whittemore, Herbert L., George W. Nusbaum, and Edgar O. Seaquist, Impact and static tensile properties of bolts, RP763... 139
Wire, steel, fatigue properties of, RP754... 17
Wool, amino-nitrogen and arginine contents of, RP787... 563
Women's hosiery, performance tests on, RP753... 1

X

Xenon, infrared spectrum of, RP781... 487
Xylose, electrolytic oxidation of, RP773... 359

Y

Young, John C., Donald Hubbard, Alfred N. Finn, Conrad A. Faick and, Index of refraction, density, and thermal expansion of some soda-alumina-silica glasses as functions of the composition, RP762... 133
Young's triangle, uniform-chromaticity scale, RP756... 41

Z

Zimmerman, Elmer W., Charles G. Weber, and Arthur E. Kimberly, Relation of ink to the preservation of written records, RP779... 463

Eng. Lit.

UNITED STATES DEPARTMENT OF COMMERCE
DANIEL C. ROPER, Secretary
NATIONAL BUREAU OF STANDARDS
Lyman J. Briggs, Director

✦

Journal of Research

of the

National Bureau of Standards

U.S.

✦

Volume 14

January to June 1935

Research Papers 753 to 803

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1935

Corrections to be noted in volume 14 of the Journal of Research of the National Bureau of Standards

Page	Line	Now reads in part	Should read
15	3	A	B
20	Line 3 should read	$S=\frac{(M_1+M_2)}{I/c}=\left(\frac{W_2a}{2}+\frac{W_1l}{8}+\frac{W_1b}{2}\right)\div\frac{\pi}{32}d^3$ b=horizontal distance from face of grip to point of support.	
203	B	$G_0(\xi)=\int_0^\xi\int_0^\xi F_0\frac{I}{L^4}d\xi d\xi=\cdots$	$G_0(\xi)=\int_0^\xi\int_0^\xi F_0\frac{L^4}{I}d\xi d\xi=\cdots$
203	(c)	$\psi_4=F_0(\xi)\cdot\frac{I}{L^4}$	$\psi_4=F_0(\xi)\cdot\frac{L^4}{I}$
211	Figure 14, b	f=34.8	f=30.7
211	Figure 14, c	f=30.7	f=34.8
285	Footnote 4	February	April
427	13	no. 4 to $-\frac{3}{8}$ in	no. 4 to $\frac{3}{8}$ in
435	22	$\sqrt{\frac{v^2}{n(n-1)}}$	$\sqrt{\frac{\Sigma v^2}{n(n-1)}}$
441	Note (line 4)	$d=\frac{19050}{88}$	$\underline{d}=\frac{19050}{88}$
441	Note (line 5)	d microns	$\underline{d}$ microns
441	Note (line 9)	$d=\frac{\Sigma nd^3}{\Sigma nd^2}$	$\underline{d}=\frac{\Sigma nd^3}{\Sigma nd^2}$
445	8	Delete "at any time, t,"	
474	5 from bottom	2000	0200
548	2 from bottom	gure 2	In figure 2
552	3	$T_L=\frac{\int^\infty VET d\lambda}{\int_0^\infty VEd\lambda}$	$T_L=\frac{\int_0^\infty VET d\lambda}{\int_0^\infty VEd\lambda}$
697	7 from bottom	(with VI	VI (with
698	Figure 2	Add to legend—Beginning at the top, the curves refer in order to solutions III, VI, V, I, and IV.	
699	Figure 3, legend	cupric iron	cupric ion
741	Table 11, heading column 4		Expansion caused by soaking, after drying at —

RESEARCH PUBLICATIONS
of the
NATIONAL BUREAU OF STANDARDS

1904–1919:

(*a*) *Bulletin of the Bureau of Standards.* A quarterly journal. The *Bulletin* contained all research papers until, in 1910, it was limited to scientific papers; see (*f*) for technical papers.
(*b*) Reprints [1] from (*a*). *Scientific Papers* S1 to S329.
(*c*) Volumes [2] of (*a*), cloth bound, consecutively paged and indexed. Volumes 1 to 14.

1919–1928:

(*d*) *Scientific Papers* [1] *of the Bureau of Standards* (separates continuing series (*b*), Nos. S330 to S572).
(*e*) Volumes [2] of (*d*), cloth bound, consecutively paged and indexed. Volumes 15 to 22.

1910–1928:

(*f*) *Technologic Papers* [1] *of the Bureau of Standards,* T1 to T370. Prior to T203 issued only as separates.
(*g*) Volumes [2] of (*f*) cloth bound, beginning with T203, volume designated No. 16, to volume 22; consecutively paged and indexed.

1928:

(*h*) *Bureau of Standards Journal of Research* (issued under new title "*Journal of Research of the National Bureau of Standards*" beginning with the July 1934 number, volume 13, no. 1); (monthly), continuing and consolidating series (*d*) and (*f*). Subscription $2.50 per year, United States, Canada, Cuba, Mexico, Newfoundland, and Republic of Panama; $3.25 elsewhere.
(*i*) Volumes [3] of (*h*), cloth bound (six monthly issues), consecutively paged and indexed.
(*j*) Separates [1] of (*h*) issued under new series title, *Research Papers.*

Circular C24 contains a list of (*a*) to (*g*) and a subject index of same to June 30, 1925. The Supplement to Circular C24 continues this list and index. These give a complete list and index of all publications to December 31, 1931, and the mimeographed insert furnished with the Supplement brings the list practically up to date. Copies of this Circular and Supplement will be found at most Government depository libraries having files of the Bureau's publications. Circular C24 may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., for 25 cents; the Supplement for 15 cents. Copies will be furnished to public libraries without charge on request to the National Bureau of Standards.

[1] For prices and other information, see Circular C24, and Supplement thereto.
[2] Volumes 1 to 21, $2 each; 22, $3. Special prices for set, address Superintendent of Documents, Government Printing Office, Washington, D. C.
[3] Volumes 1 to 6, $2.75 each; 7 to 12, $3 each. For shipment to foreign countries add 50 cents to the cost of the volume.

23876—35

Separate copies of the Research Papers listed may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C., at 5 cents each (Research Papers 763, 794, 803, 10 cents each) or at a discount of 25 percent for 100 copies or more. Remittance should be in the form of a post-office money order, coupons (issued by the Superintendent of Documents for the specific purpose of purchasing Government publications), express money order, New York draft, or cash at sender's risk.

CONTENTS OF VOLUME 14

Vol. 14—January 1935—No. 1

RP — Page

753. Factors affecting the performance of hosiery on the hosiery-testing machine. *Herbert F. Schiefer and Richard S. Cleveland* 1
754. Fatigue properties of steel wire. *Stephen M. Shelton and William H. Swanger* 17
755. Interference measurements in the infrared arc spectrum of iron. *William F. Meggers* 33
756. A Maxwell triangle yielding uniform chromaticity scales. *Deane B. Judd* 41
757. Use of the pipette method in the fineness test of molding sand. *Clarence E. Jackson and C. M. Saeger, Jr* 59
758. Moisture relations of aircraft fabrics. *Gordon M. Kline* 67

Vol. 14—February 1935—No. 2

759. The national primary standard of radio frequency. *Elmer L. Hall, Vincent E. Heaton, and Evan G. Lapham* 85
760. Specific volume, compressibility, and volume thermal expansivity of rubber-sulphur compounds. *Arnold H. Scott* ... 99
761. Influence of magnesium sulphate on the deterioration of vegetable-tanned leather by sulphuric acid. *Roy C. Bowker, Everett L. Wallace, and Joseph R. Kanagy* 121
762. Index of refraction, density, and thermal expansion of some soda-alumina-silica glasses as functions of the composition. *Conrad A. Faick, John C. Young, Donald Hubbard, and Alfred N. Finn* 133
763. Impact and static tensile properties of bolts. *Herbert L. Whittemore, George W. Nusbaum, and Edgar O. Seaquist* .. 139
764. A method for determining stresses in a nonrotating propeller blade vibrating with a natural frequency. *Walter Ramberg, Paul S. Ballif, and Mack J. West* 189
765. Combining weight of collagen. *John Beek, Jr* 217

Vol. 14—March 1935—No. 3

766. Monitoring the standard radio-frequency emissions. *Evan G. Lapham* 227
767. Standard tables for chromel-alumel thermocouples. *Wm. F. Roeser, A. I. Dahl, and G. J. Gowens* 239
768. Methods of testing thermocouples and thermocouple materials. *Wm. F. Roeser and H. T. Wensel* 247
769. Multifrequency ionosphere recording and its significance. *Theodore R. Gilliland* 283

RP Page

770. Optical rotations and other properties of the lead and calcium aldonates. *Horace S. Isbell* 305
771. Experiments on exterior waterproofing materials for masonry. *Daniel W. Kessler* 317
772. An accurate ebullioscopic method for determining the molecular weights of nonvolatile petroleum fractions. *Beveridge J. Mair* 345
773. Electrolytic oxidation of xylose in the presence of alkaline earth bromides and carbonates. *Horace S. Isbell and Harriet L. Frush* 359
774. A precision cathetometer. *Charles Moon* 363

Vol. 14—April 1935—No. 4

775. Accuracy of high-range current transformers. *John H. Park* 367
776. Standard conditions for precise prism refractometry. *Leroy W. Tilton* 393
777. Effect of granulometric composition of cement on the properties of pastes, mortars, and concretes. *J. Arthur Swenson, Lacey A. Wagner, and George L. Pigman* 419
778. Chemical reactions in the lead storage battery. *George W. Vinal and D. Norman Craig* 449
779. Relation of ink to the preservation of written records. *Elmer W. Zimmerman, Charles G. Weber, and Arthur E. Kimberly* 463
780. Recent studies of the ionosphere. *Samuel S. Kirby and Elbert B. Judson* 469
781. Infrared spectra of noble gases (10500 to 13000 A). *William F. Meggers* 487
782. Effect of calcium chloride on portland cements and concretes. *Paul Rapp* 499
783. Arc spectrum of copper in the infrared. *C. C. Kiess* 519

Vol. 14—May 1935—No. 5

784. Thermal expansion of monocrystalline and polycrystalline antimony. *Peter Hidnert* 523
785. A filter for obtaining light at wave length 560 mμ. *Kasson S. Gibson* 545
786. Refractive index of rubber. *Archibald T. McPherson and Arthur D. Cummings* 553
787. Amino-nitrogen contents of wool and collagen. *Joseph R. Kanagy and Milton Harris* 563
788. Fire-resistant doped fabric for aircraft. *Gordon M. Kline* 575
789. Gold-cobalt resistance alloys. *James L. Thomas* 589
790. A method for finding the roots of the equation $f(x)=0$ where f is analytic. *Charles L. Critchfield and John Beek, Jr* 595
791. Heats of reaction of the system: rubber-sulphur. *Archibald T. McPherson and Norman Bekkedahl* 601
792. Thermal behavior of the kaolin minerals. *Herbert Insley and Raymond H. Ewell* 615
793. Multiplets and terms in the first two spectra of columbium. *William F. Meggers and Bourdon F. Scribner* 629

Vol. 14—June 1935—No. 6

RP Page

794. A study of the relation of some properties of cotton rags to the strength and stability of experimental papers made from them. *Merle B. Shaw, George W. Bicking, and Martin J. O'Leary* 649

795. Effect of antioxidants on the natural and the accelerated aging of rubber. *Rees F. Tener and William L. Holt* 667

796. An apparatus for measuring the boiling points of lubricating oils and other compounds of high molecular weight at reduced pressures. *Sylvester T. Schicktanz* 685

797. Mechanism of chromium deposition from the chromic acid bath. *Charles Kasper* 693

798. Performance of a hollow-ware extrusion machine with different combinations of augers, spacers, and dies. *Paul V. Johnson and Ray T. Stull* 711

799. Behavior of high-early-strength cement concretes and mortars under various temperature and humidity conditions. *Louis Schuman and Edward A. Pisapia* 723

800. Recent sound-transmission measurements at the National Bureau of Standards. *Vivian L. Chrisler and Wilbert F. Snyder* 749

801. Selective adsorption from soap solutions. *Harvey A. Neville and Milton Harris* 765

802. Effect of sulphuric acid on chrome-tanned leather. *Everett L. Wallace, John Beek, Jr., and Charles L. Critchfield* 771

803. Atmospheric exposure tests on nonferrous screen wire cloth. *G. Willard Quick* 775

Index to Volume 14 (January to June 1935) Research Papers 753 to 803 795